

What is claimed is:

1. A seed meter comprising:

a housing at least partly defining a seed bin and a disengagement zone;

a seed disk operable to carry seeds from the seed bin to the disengagement zone when

5 rotated relative to the housing on a disk axis of rotation; and

a seed eliminator at least partly disposed alongside the seed disk and operable to

contact at least one of the seeds carried by the seed disk,

said seed eliminator being shiftable from a normal position to a deflected position via

contact with said at least one of the seeds.

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2. The meter as claimed in claim 1,

at least a portion of said eliminator shifting at least about 1/16" away from the disk

axis when the seed eliminator is shifted from the normal position to the

deflected position.

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3. The meter as claimed in claim 1,

said seed eliminator being translationally fixed relative to the housing,

said seed eliminator pivoting away from the disk axis when shifted from the normal

position to the deflected position.

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4. The meter as claimed in claim 1,

said seed eliminator including spaced apart first and second ends,

said seed eliminator presenting a substantially smooth leading edge extending from

the first end to the second end,

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said leading edge being closer to the disk axis of rotation at the second end than at

the first end when the seed eliminator is in the normal position.

5. The meter as claimed in claim 4,

said leading edge being at least about 1/8" closer to the disk axis of rotation at the

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second end than at the first end when the seed eliminator is in the normal

position.

6. The meter as claimed in claim 4,  
said seed disk defining a plurality of spaced apart seed holes for holding the seeds  
against the seed disk via vacuum force,  
said leading edge extending further than the minimum distance between adjacent  
5 ones of said seed holes.

7. The meter as claimed in claim 6,  
said leading edge extending a distance that is at least twice the minimum distance  
between adjacent ones of said seed holes.

8. The meter as claimed in claim 4,  
said leading edge extending at least about 2".

9. The meter as claimed in claim 4,  
15 said leading edge having substantially no serrations.

10. The meter as claimed in claim 4; and  
an adjustment mechanism coupled to the housing and the seed eliminator,  
said adjustment mechanism being configured to vary the distance between the  
20 leading edge and the disk axis of rotation when the seed eliminator is in the  
normal position.

11. The meter as claimed in claim 10,  
said adjustment mechanism including an adjuster element adjustably coupled to the  
25 seed eliminator and a stop fixedly attached to the housing,  
said adjuster element engaging the stop when the seed eliminator is in the normal  
position,  
said adjuster element being spaced from the stop when the seed eliminator is in the  
deflected position.

12. The meter as claimed in claim 11,  
said adjuster element and said seed eliminator being threadably intercoupled so that  
rotation of the adjuster element causes at least a portion of the adjuster  
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element to shift towards or away from the leading edge.

13. The meter as claimed in claim 12,  
said adjustment mechanism including a compression spring contacting the adjuster  
5 element and the seed eliminator,  
said compression spring being configured to restrain relative rotation of the adjuster  
element and the seed eliminator.

14. The meter as claimed in claim 1; and  
10 a biasing mechanism configured to bias the seed eliminator towards the normal  
position.

15. The meter as claimed in claim 14,  
said biasing mechanism comprising a torsion spring.

16. The meter as claimed in claim 1,  
said seed disk presenting a seed surface and a vacuum surface facing generally  
opposite the seed surface,  
said seed disk defining a plurality of spaced-apart seed holes for holding the seeds  
20 against the seed side of the disk via vacuum force,  
each of said plurality of seed holes presenting a minimum hole diameter,  
said minimum hole diameter being spaced from the vacuum surface by a distance of  
at least about 3/16".

17. The meter as claimed in claim 1,  
said seed disk having a resistance to bending such that a normal force greater than  
about 5 pounds is required to cause a deflection of 1/8" when the disk is fixed  
at the disk axis and the force and deflection are applied and measured at a  
location 5" from the disk axis.

18. The meter as claimed in claim 1,  
said seed disk defining a plurality of grooves,  
each of said plurality of grooves being configured to agitate the seeds as the groove

rotates through the seed bin,  
each of said plurality of grooves presenting leading and trailing edges as the disk  
rotates,  
said trailing edge presenting a tapered surface.

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19. The meter as claimed in claim 1,  
said seed disk and said housing being configured so that substantially the only items  
contacting the seed disk but not rotating with the seed disk are the seeds in the  
seed bin.

20. A seed meter comprising:  
a housing at least partly defining an internal chamber; and  
a seed disk at least partly disposed in the housing and rotatable relative thereto,  
said seed disk dividing the internal chamber into a seed-transfer portion and a  
5 pressure-controlled portion,  
said seed disk presenting a seed side adjacent the seed transfer-portion and a vacuum  
side adjacent the pressure-controlled portion,  
said seed disk defining a plurality of seed attachment holes extending axially through  
the disk from the seed side to the vacuum side,  
10 each of said seed holes having a minimum diameter,  
said minimum diameter being axially spaced from the vacuum side by at least about  
1/8".

21. The meter as claimed in claim 20,  
15 said minimum diameter being axially spaced from the vacuum side by at least about  
3/16".

22. The meter as claimed in claim 20,  
said minimum diameter being axially spaced from the vacuum side by at least about  
20 1/4".

23. The meter as claimed in claim 22,  
said minimum diameter being in the range of from about 1/8" to about 1/4".

24. The meter as claimed in claim 20,  
25 said seed side of the seed disk defining a plurality of grooves.

25. The meter as claimed in claim 24,  
each of said grooves presenting leading and trailing edges,  
30 said trailing edge presenting a tapered surface.

26. A seed meter comprising:  
a housing at least partly defining a seed bin and a disengagement zone; and  
a seed disk disposed within and rotatable relative to the housing on a disk axis of  
rotation,  
5 said seed disk defining a plurality of seed attachment holes configured to carry seeds  
from the seed bin to the disengagement zone when the disk is rotated,  
said seed disk having a resistance to bending such that a normal force greater than  
about 5 pounds is required to cause a deflection of 1/8" when the disk is fixed  
at the disk axis and the force and deflection are applied and measured at a  
10 location 5" from the disk axis.

27. The meter as claimed in claim 26,  
said seed disk having a resistance to bending such that a normal force greater than  
about 25 pounds is required to cause a deflection of 1/8" when the disk is  
15 fixed at the disk axis and the force and deflection are applied and measured  
at a location 5" inches from the disk axis.

28. The meter as claimed in claim 26,  
said seed disk being formed of material having a modulus of elasticity of at least  
20 about  $5 \times 10^6$  psi,  
said seed disk being formed of material having a Brinell hardness rating within the  
range of about 20 to about 180 bhn.

29. The meter as claimed in claim 26,  
25 said seed disk being formed of a material comprising aluminum.

30. The meter as claimed in claim 26,  
said seed disk having a thickness not less than about 3/16" proximate the seed  
attachment holes.  
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31. The meter as claimed in claim 26,  
said seed disk defining a plurality of grooves,  
each of said plurality of grooves being configured to agitate the seeds as the groove

rotates through the seed bin,  
each of said plurality of grooves presenting leading and trailing edges as the disk  
rotates,  
said trailing edge presenting a sloped surface.

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32. The meter as claimed in claim 26,  
said seed disk and said housing being configured so that substantially the only non-  
rotating items contacting the seed disk are the seeds in the seed bin.

33. A seed meter comprising:  
a housing at least partly defining an internal chamber; and  
a seed disk at least partly disposed in the chamber and dividing the internal chamber  
into a seed-transfer portion and a pressure-controlled portion,  
5 said housing including a substantially rigid separator wall dividing the pressure-  
controlled portion into a vacuum zone and an ambient zone,  
said separator wall being spaced from the seed disk,  
said separator wall presenting a substantially rigid terminal edge extending alongside  
the seed disk,  
10 said terminal edge being spaced from the seed disk by a maximum distance of not  
more than about 1/16".

34. The meter as claimed in claim 33,  
said terminal edge being spaced from the seed disk by a maximum distance of not  
15 more than 1/32".

35. The meter as claimed in claim 33,  
said terminal edge being substantially planar.

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36. A rotatable seed disk adapted for use in a vacuum seed meter, said disk comprising:

a substantially flat and substantially circular panel,  
said panel presenting first and second generally parallel and opposite faces,  
5 said panel defining a central axis of rotation and a plurality of seed attachment  
holes equally spaced from the axis of rotation and from one another,  
each of said seed attachment holes presenting a minimum diameter that is spaced  
from one of said first and second faces by at least about 3/16".

10 37. The seed disk as claimed in claim 36,  
said panel having a thickness not less than about 1/4" proximate each of the seed  
attachment holes.

38. The seed disk as claimed in claim 36,  
15 said panel having a resistance to bending such that a normal force greater than  
about 25 pounds is required to cause a deflection of 1/8" when the panel is  
fixed at the axis of rotation and the force and deflection are applied and  
measured at a location 5 inches from the axis of rotation.

20 39. The seed disk as claimed in claim 38,  
said panel being formed of material having a modulus of elasticity not less than  
about  $5 \times 10^6$  psi,  
said panel being formed of material having a Brinell hardness rating within the  
range of about 20 to about 180 bhn.

25 40. The seed disk as claimed in claim 38,  
said panel being formed of a material comprising aluminum.

41. The seed disk as claimed in claim 36,  
30 said panel defining a plurality of grooves,  
each of said plurality of grooves presenting leading and trailing edges,  
said trailing edge presenting a tapered surface.

42. The seed disk as claimed in claim 41,  
said grooves being equally spaced from one another and from the axis of rotation.

43. A method of metering seeds, said method comprising the steps of:

(a) introducing the seeds into a seed meter comprising a housing and a seed disk disposed in the housing, said housing and said seed disk cooperatively defining a seed bin for holding the seeds;

5 (b) coupling a plurality of the seeds to the seed disk;

(c) rotating the seed disk relative to the housing to thereby transport the seeds coupled to the disk from the seed bin to a disengagement zone; and

(d) decoupling the seeds from the seed disk in the disk engagement zone, said rotating of step (c) being performed without contacting the seed disk with any

10 non-rotating solid items other than the seeds in the seed bin.

44. The method as claimed in claim 43,

step (b) including using a vacuum attachment force to couple said plurality of the seeds to the seed disk,

15 step (d) including reducing the magnitude of the vacuum attachment force.

45. The method as claimed in claim 43; and

(e) simultaneously with step (c), contacting at least one of the seeds coupled to the seed disk with a seed eliminator.

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46. The method as claimed in claim 45,

step (e) including causing the seed eliminator to shift relative to the housing via contact with said at least one of the seeds.

25 47. The method as claimed in claim 45,

step (e) including causing one of the seeds to become decoupled from the seed disk via contact with the seed eliminator.

48. The method as claimed in claim 45,

30 step (e) including contacting said at least one of the seeds with a substantially smooth, non-serrated leading edge of the seed eliminator.

49. The method as claimed in claim 43,  
step (c) including using grooves formed in the seed disk to agitate the seeds in the  
seed bin.